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EVALUATION OF PRUNING TO REDUCE IMPACT OF WHITE PINE BLISTER RUST ON SELECTED AREAS IN YELLOWSTONE NATIONAL PARK

by

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SUMMARY

White pine blister rust still poses a threat to the relic limber pine stand in the Mammoth Hot Springs Terrace area; pruning of cankers is an effective means of preserving the limber pine as long as possible.

INTRODUCTION

An evaluation of canker pruning to protect a large relic stand of limber pine from white pine blister rust in and around Park headquarters (figure 1) was made on April 29, 1974. Oscar Dooling and Malcolm Berg examined the areas.

TECHNICAL INFORMATION

Causal agent.--White pine blister rust fungus, *Cronartium ribicola* J. C. Fisch. ex Rabenh.

Hosts.--Limber pine, *Pinus flexilis* James; whitebark pine, *P. albicaulis* Engel.; and gooseberry, *Ribes* spp.

Type of damage.--Girdling cankers on branches or main stem resulting in branch dieback and/or tree mortality on limber and whitebark pine; leaf spots causing little damage on ribes.

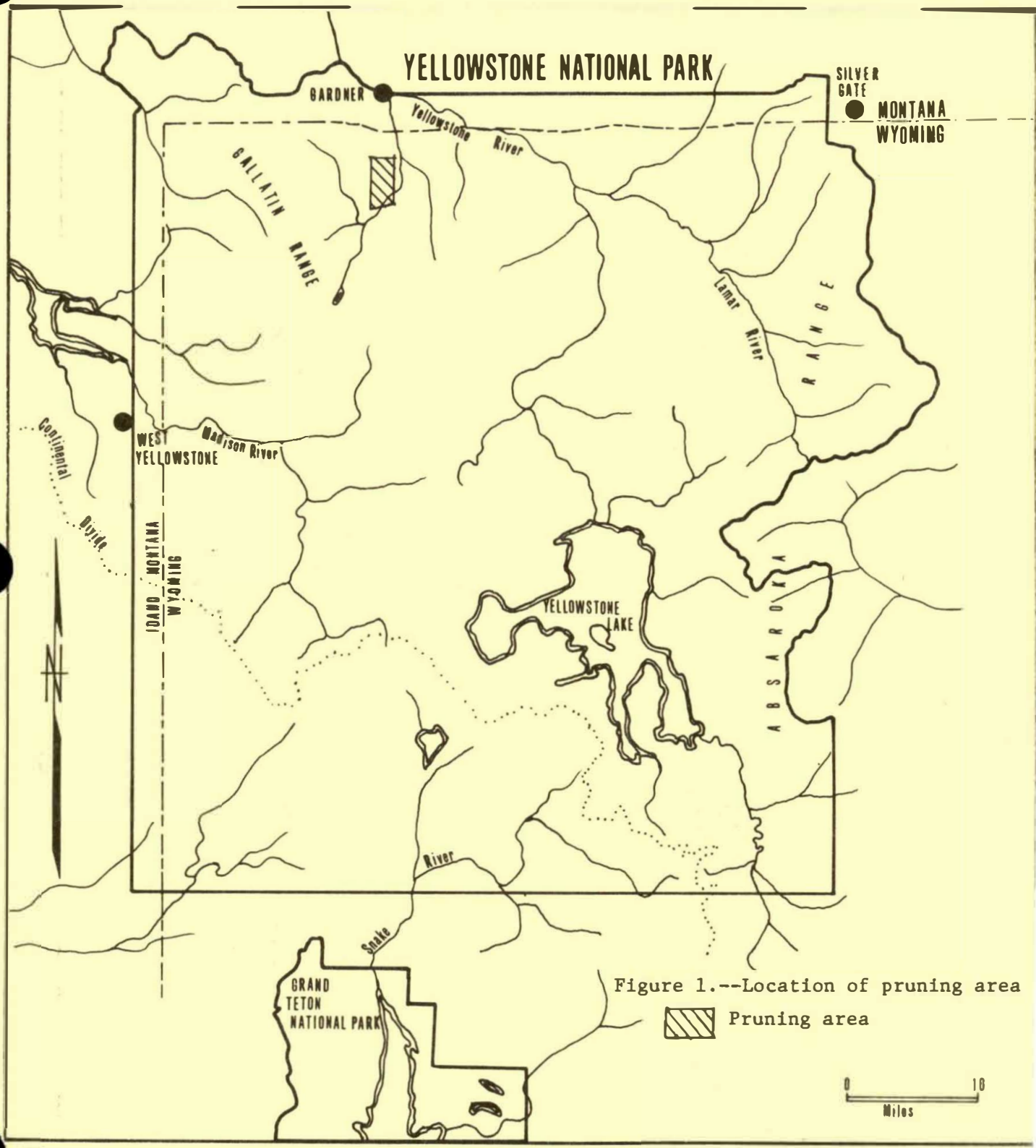

Figure 1.--Location of pruning area

Pruning area

Description of area.--Park headquarters area and Mammoth Hot Springs Terrace immediately south of Park headquarters (Figure 2). Contains about 3,800 acres.

RESULTS AND DISCUSSION

For more than 3 decades, Yellowstone's white pine population has been threatened by blister rust. The possible loss of native trees to an introduced disease has been of concern to Park personnel.

In and around Park headquarters at Mammoth is a large relic limber pine stand valuable for historical and esthetic reasons. Ribes eradication was begun in the 1940's and carried on until 1969. A 5-year moratorium was placed on eradication in 1969 to determine the value of ribes eradication in preventing disease spread. The area is relatively ribes free, but infection is still occurring.

A large infection center in the Glen Creek drainage lies 2 to 3 miles southwest of the Mammoth area. The Glen Creek area was one of the initial infection centers in the Park. The infection center is in a narrow canyon, and down-slope, down-canyon winds funnel through the canyon and across the Mammoth area.

Field crews have searched out and removed cankers between Mammoth and the Glen Creek infection center. In 1972, the crews inspected and pruned only 340 acres, averaging 2 acres per man-day. These were large trees and had to be climbed for inspection and pruning. In 1973, the crews inspected and pruned 1,027 acres, averaging 4 acres per man-day. The trees were smaller than those treated in 1972, but some trees had in excess of 150 cankers.

Four acres per man-day is a realistic estimate of 1974 requirements. At this rate, about 1,200 acres should be treated in 1974, leaving 1,273 acres to treat in 1975. The entire area of 3,840 acres would be considered in a maintenance status by 1976.

Cost of inspection and pruning is about $20 per acre.

RECOMMENDATIONS

Decision for control.--Several alternatives for treatment of the area should be considered. They are (1) do nothing, (2) ribes eradication with or without pruning, and (3) pruning only.

(1) Do nothing. This is not a viable alternative because of the unique historical and esthetic value of the relic stand.

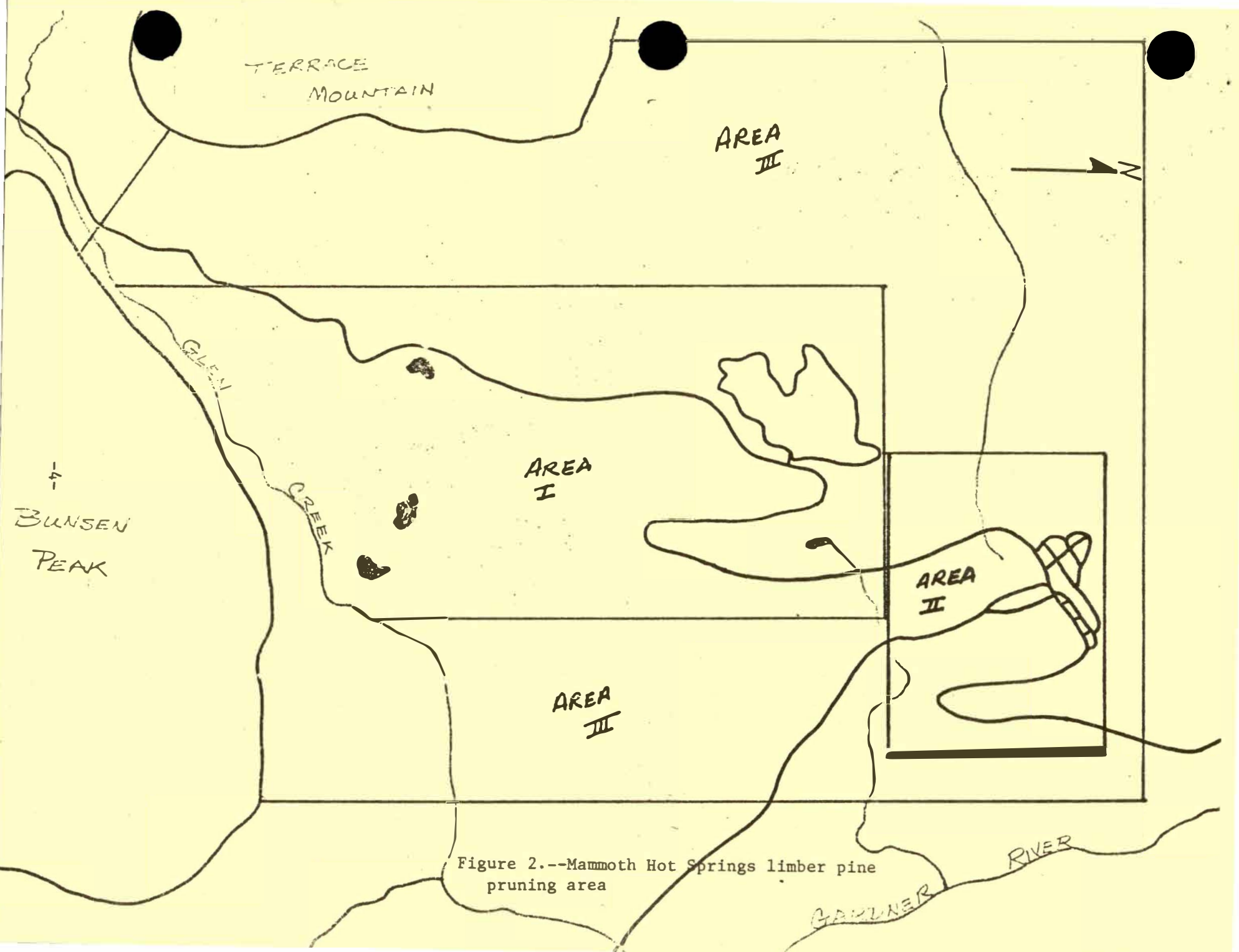

Figure 2.--Mammoth Hot Springs limber pine pruning area

(2) Ribes eradication with or without pruning. This is not recommended because successful completion of the control evaluation depends on cessation of eradication over a 5- to 10-year period and monitoring changes in the status of infection on pine.

(3) Pruning only. This is recommended because we wish to maintain a low level of rust incidence in areas of high visitor use.

Control method.--Inspect all limber pine in the Mammoth area and prune off all blister rust cankers with hand tools.

Impact of control on other resources.--Because pruning will be mechanical and no chemicals are involved, there will be no adverse impact on other resources.